

We claim:

1. A method of forming soot for use in the manufacture of glass while maintaining a plug free liquid delivery system, said method comprising the steps of:
 - a) selectively delivering an alkoxide liquid reactant and a nonatomized evaporative liquid to a combustion zone through a common conduit;
 - b) transitioning between said liquid reactant and said evaporative liquid during said selectively delivering step; and
 - c) reacting said liquid reactant in said combustion zone to form the soot.
2. The method as claimed in claim 1 further comprising the step of:
 - d) evaporating said evaporative liquid in said combustion zone during transient flow conditions.
3. The method as claimed in claim 1 wherein step c) comprises the step of simultaneously decreasing flow of said evaporative liquid while increasing flow of said liquid reactant.
4. The method as claimed in claim 1 wherein step c) comprises the step of simultaneously increasing flow of said liquid reactant while decreasing flow of said evaporative liquid.
5. The method as claimed in claim 3 wherein the step of decreasing flow of said evaporative liquid while increasing flow of said liquid reactant includes the step of activating a valve.
6. The method as claimed in claim 1 wherein step a) includes the step of selectively delivering said liquid reactant and said evaporative liquid through an atomizing burner assembly connected to said conduit.

7. The method as claimed in claim 6 wherein said transitioning step is effective to prevent deposits of solids in or on said atomizing burner assembly or said conduit.

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8. The method as claimed in claim 1 wherein said transitioning step occurs in a manner effective to prevent the premature reaction of said liquid reactant with air.

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9. The method as claimed in claim 1 wherein said evaporative liquid comprises an organic oxygen-containing compound or organic nitrogen-containing compound.

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10. The method as claimed in claim 1 wherein said evaporative liquid comprises an organic oxygen - containing compound selected from the group consisting of alcohols, β -diketones, ketones, esters, ethers, glycols, and amides.

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11. The method as claimed in claim 1 wherein said liquid reactant comprises a glass precursor capable of making glass soot used to manufacture preforms for optical waveguide fibers.

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12. The method as claimed in claim 1 further comprising the steps of:
staging said liquid reactant and said evaporative liquid in an enclosure;
and
introducing an inert gas into said enclosure.

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13. The method as claimed in claim 12 wherein the step of introducing an inert gas into said enclosure comprises the step of continuously feeding said inert gas into said enclosure in an amount which is sufficient to maintain a dry environment.

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14. The method as claimed in claim 12 wherein said inert gas comprises nitrogen.

15. The method as claimed in claim 12 wherein said inert gas comprises argon.

16. The method as claimed in claim 1 wherein the transitioning step occurs during steady state liquid flow.

17. A method of depositing soot to make a glass preform for optical fibers in accordance with claim 1 wherein step d) comprises forming a preform from said soot.

18. The method as claimed in claim 17 further comprising the step of delivering a dopant into said combustion zone through said conduit to create doped soot.

19. The method as claimed in claim 18 wherein said dopant comprises erbium.

20. A liquid delivery system for creating soot in a combustion zone, said system comprising:

an alkoxide liquid reactant;

an organic evaporative liquid;

a burner assembly constructed and arranged to discharge said liquid reactant and said evaporative liquid into the combustion zone;

a conduit extending upstream of said burner assembly and adapted to selectively deliver said liquid reactant and said evaporative liquid to said burner assembly; and

means for transitioning between said liquid reactant and said evaporative liquid within said conduit.

21. The system as claimed in claim 20 further comprising an enclosure constructed and arranged to house said liquid reactant and said evaporative liquid.

5 22. The system as claimed in claim 21 wherein said enclosure is selectively provided with an inert gas atmosphere to form an environment essentially free of water.

10 23. The system as claimed in claim 22 wherein said inert gas comprises nitrogen.

15 24. The system as claimed in claim 20 wherein said liquid reactant comprises a glass precursor capable of making glass soot used to manufacture preforms for optical waveguide fibers.

20 25. The system as claimed in claim 20 wherein said means for transitioning between said liquid reactant and said evaporative liquid comprises a valve.